APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/749,862	12/31/2003	Oleg Kiselev	VRT0058P1US	6313

			EXAMINER
60429	7590	05/22/2006	RUTZ, JARED IAN

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ART UNIT	PAPER NUMBER
2187	

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
 Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>31 December 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-18</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-18</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>31 December 2003</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date <u>4/17/06; 11/3/05</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-18 as originally filed on 12/31/2003 are pending in the instant

application. Of these there are 4 independent claims and 14 dependent claims. The

instant application is a Continuation In Part of application 10/610,604, now Patent

number 7,028,156, filed 7/1/2003.

Information Disclosure Statement

2.   The information disclosure statement (IDS) submitted on 11/3/2005 is in

compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure

statement is being considered by the examiner.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.   **Claim 17** is rejected under 35 U.S.C. 102(b) as being anticipated by Hubis (US

6,321,298).

4.   **Claim 17** is taught by Hubis as:

a.   *A computer readable medium comprising instructions executable by a first*

computer system. Column 3 lines 34-38 show that the controller routines are

firmware that is executed by a controller.

b.   *Wherein the first computer system performs a method in response to*

executing the instructions. Column 4 lines 42-43 show that the steps of figure 5

are performed by the controller under control of the read program.

c.   *The method comprising: receiving a request for data from a computer*

system, wherein the data is identified by a unique name in the request. Column

3 lines 28-33 shows that a read command designates the address and size of the

data to be read, which is a unique name.

d.   *Accessing a first mirror of a data volume to read the requested data or*

accessing a cache memory to read the requested data depending on whether the

request from the computer system is an initial request for the data or a

subsequent request for the data received after the initial request. Column 4 lines

56-65 shows that the controller checks its read cache to see if the requested data

is stored in the read cache. If the requested data is not in the read cache it is

read from the storage devices and then stored in the read cache. If it is in the

read cache, the data is returned from the read cache. On a subsequent request

the requested data would be stored in the read cache, and accordingly would be

read from the read cache.

Double Patenting

5.   The nonstatutory double patenting rejection is based on a judicially created
doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the
unjustified or improper timewise extension of the "right to exclude" granted by a patent
and to prevent possible harassment by multiple assignees. A nonstatutory
obviousness-type double patenting rejection is appropriate where the conflicting claims
are not identical, but at least one examined application claim is not patentably distinct
from the reference claim(s) because the examined application claim is either anticipated
by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140

F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6.   **Claims 1, 5, 9, 13, 14, and 18** are rejected on the ground of nonstatutory

obviousness-type double patenting as being unpatentable over claims 1, 9, and 12 of

U.S. Patent No. 7,028,156 in view of Bearden et al. (US 2004/0205298).

10/479,862	7,028,156
1. A method comprising: receiving a first read request from a computer system.	1. In a data storage system, a method comprising receiving a first request to read data from a data volume, wherein the first request is received from a computer system
Reading data from a first mirror of a data volume in response to receiving the first read request.	Reading data from a first memory configured to store the data volume in response to receiving the first request

Reading data from a second mirror of the data volume in response to receiving the first read request.	Reading data from a second memory configured to store a mirrored copy of the data volume in response to receiving the first request
Returning the data read from the first mirror to the computer system.	Returning the data read from the first memory to the computer system
Storing the data read from the second mirror into a cache memory.	Storing the data read from the second memory into a memory device
Receiving a second read request from the computer system, wherein the second read request is received subsequent to the first read request, and wherein the first and second read requests seek the same data.	Receiving a second request to read from the data volume, wherein the second request is received from the computer system, and wherein the first and second . requests seek the same data.
Returning data stored in the cache memory in response to receiving the second read request.	Bearden teaches returning data stored in a cache when the data is requested (paragraph 0029)
5. further comprising comparing time T1 with time T2, wherein time T1 is the time when the first read request was received, and wherein time T2 is the time when the second read request was received	Comparing time T1 with time T2, wherein time T1 is the time when the first request was received, and wherein time T2 is the time when the second request was received

9. A computer readable medium comprising instructions executable by a first computer system, wherein the first computer system performs a method in response to executing the instructions, the method comprising: receiving a first read request from a computer system Reading data from a first mirror of a data volume in response to receiving the first read request.	9. A computer readable medium comprising instructions executable by a first computer system, wherein the first computer system performs a method in response to executing the instructions, the method comprising: reading data from a first memory configured to store a data volume in response to receiving a first request to read data from the data volume, wherein the first request is received from a second computer system in data communication with the first computer system
Reading data from a second mirror of the data volume in response to receiving the first read request.	Reading data from a first memory configured to store a mirrored copy of the data volume in response to receiving the first request
Returning the data read from the first mirror to the computer system.	Returning the data read from the first memory to the second computer system
Storing the data read from the second mirror into a cache memory.	Storing the data read from the second memory into a memory device of the first computer system
Receiving a second read request from the computer system, wherein the second read request is received subsequent to the first read request, and wherein the first and second read requests seek the same data.	Receiving a second request to read from the data volume, wherein the second request is received from the computer system, and wherein the first and second requests seek the same data
Returning data stored in the cache memory in response to receiving the second read request.	Bearden teaches returning data stored in a cache when the data is requested (paragraph 0029)
13. Further comprising comparing time T1 with time T2, wherein time T1 is the time when the first read request was received, and wherein time T2 is the time when the second read request was received	Comparing time T1 with time T2, wherein time T1 is the time when the first request was received, and wherein time T2 is the time when the second request was received.

14. further comprising reading the data stored in the cache memory in response to receiving the second request only if time T2 occurs within a predetermined amount of time after T1	12. wherein the method further comprises reading the data stored in the memory device only if time T2 occurs within a predetermined amount of time after T1; returning the data read from the memory device to the computer system.
18 A data processing system comprising; a first computer system coupled to a memory system, wherein the memory system stores a data volume comprising a first mirror and a second mirror. Wherein the first computer system comprises a memory for storing instructions executable by the first computer system. Wherein the first computer system implements a method in response to executing the instructions, the method comprising: receiving a first read request from a computer system.	1. In a data storage system, a method comprising: *Bearden teaches a computer system, item 302 of fig 3, comprising a memory for storing instructions executable by the computer system, item 330 of fig 3.* *Bearden teaches that the computer system implements methods when executing the stored instructions, paragraph 0055.*
Reading data from the first mirror in response to receiving the first read request.	Receiving a first request to read data from a data volume, wherein the first request is received from a computer system; reading data from a first memory configured to store the data volume in response to receiving the first request
Reading data from the second mirror of the data volume in response to receiving the first read request.	Reading data from a second memory configured to store a mirrored copy of the data volume in response to receiving the first request

Returning the data read from the first mirror to the computer system.	Returning the data read from the first memory to the computer system
Storing the data read from the second mirror into a cache memory.	Storing the data read from the first memory into a memory device
Receiving a second read request from the computer system, wherein the second read request is received subsequent to the first read request, and wherein the first and second read requests are for the same data.	Receiving a second request to read data from the data volume, wherein the second request is received from the computer system, and wherein the first and second requests seek the same data
Returning data stored in the cache memory in response to receiving the second read request.	Bearden teaches returning data stored in a cache when the data is requested (paragraph 0029)
	Comparing time T1 with time T2, wherein time T1 is the time when the first request was received, and wherein time T2 is the time when the second request was received

7.   The invention of claims 1, 5, 9, 13, 14, and 18 differs from the invention claimed in patent 7,028,156 as shown *supra*.

8.   Bearden teaches the usage of pre-fetching data that is likely to be requested by a host computer, paragraph 0004.

9.   US patent 7,028,156 and Bearden are analogous art because they are from the same field of endeavor, the design of computer data storage systems.

10.   At the time of the invention it would have been obvious to one of ordinary skill in the art to pre-fetch the data stored in the second mirror and store it in a cache memory.

11.   The motivation for doing so would have been to improve the data rate by retrieving data from storage ahead of time, Bearden paragraph 0004.

12.   Therefore, it would have been obvious to combine Bearden with US patent

7,028,156 for the benefit of improving the data rate between the storage system and the

requesting computer to obtain the invention as specified in claims 1, 5, 9, 13, 14, and

18.

13.   **Claims 1-6, 9-11, 13, and 18** are provisionally rejected on the ground of

nonstatutory double patenting over claims 1-4, 8, 14-17, and 23 of copending

Application No. 10/742,129 in view of Bearden (cited *supra*). This is a provisional

double patenting rejection since the conflicting claims have not yet been patented.

14.   The subject matter claimed in the instant application is fully disclosed in the

referenced copending application and would be covered by any patent granted on that

copending application since the referenced copending application and the instant

application are claiming common subject matter, as follows:

15.   Independent **claim 1** of the instant applicant differs from independent claim 1 of

application 10/742,129 in that the instant application performs pre-fetching of the data

stored in the second mirror when the first read request is received and returns the data

stored in the cache when the second read request is received.

16.   Independent **claim 9** of the instant applicant differs from independent claim 14 of

application 10/742,129 in that the instant application performs pre-fetching of the data

stored in the second mirror when the first read request is received and returns the data

stored in the cache when the second read request is received.

17.   Independent **claim 18** of the instant applicant differs from independent claim 23

of application 10/742,129 in that the instant application performs pre-fetching of the data

stored in the second mirror when the first read request is received and returns the data

stored in the cache when the second read request is received.

18.   Bearden teaches the usage of pre-fetching data that is likely to be requested by a

host computer, paragraph 0004.

19.   Application No. 10/742,129 and Bearden are analogous art because they are

from the same field of endeavor, the design of computer data storage systems.

20.   At the time of the invention it would have been obvious to one of ordinary skill in

the art to pre-fetch the data stored in the second mirror and store it in a cache memory.

21.   The motivation for doing so would have been to improve the data rate by

retrieving data from storage ahead of time, Bearden paragraph 0004.

22.   Therefore, it would have been obvious to combine Bearden with Application No.

10/742,129 for the benefit of improving the data rate between the storage system and

the requesting computer to obtain the invention as specified in claims 1-6, 9-11, 13, and

18.

23.   Dependent claims 2-6, 10, 11, and 13 correspond to the claims of application

10/742,129 as follows:

10/749,862	2	3	4	5	6	10	11	13
10/742,129	2	3	4	8	8	15	16	17

24.   Furthermore, there is no apparent reason why applicant would be prevented from

presenting claims corresponding to those of the instant application in the other

copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA

1968). See also MPEP § 804.

25.   **Claims 1, 5, 6, 9, and 18** are provisionally rejected on the ground of nonstatutory

double patenting over claims 24, 25, 32, and 41 of copending Application No.

11/242,216. This is a provisional double patenting rejection since the conflicting claims

have not yet been patented.

26.   The subject matter claimed in the instant application is fully disclosed in the

referenced copending application and would be covered by any patent granted on that

copending application since the referenced copending application and the instant

application are claiming common subject matter, as follows:

27.   All limitations of independent **claim 1** of the instant application are recited in

claim 24 of application 11/242,216.

28.   Dependent **claims 5 and 6** of the instant application specify comparing two times

relating to when read requests are received, and only returning the data stored in the

cache if the second request occurs within a predetermined amount of time after the first

request. Claim 25 of application 11/142,216 requires returning the data stored in the

memory device if the second request is received within a predetermined amount of time

after receiving the first request.

29.   All limitations of independent **claim 9** of the instant application are recited in

claim 32 of application 11/142,216.

30.   All limitations of independent **claim 18** of the instant application are recited in

claim 40 of application 11/142,216.

31.   Furthermore, there is no apparent reason why applicant would be prevented from

presenting claims corresponding to those of the instant application in the other

copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA

1968). See also MPEP § 804.

Allowable Subject Matter

32.   **Claims 1-16 and 18** are allowed over the prior art.

33.   Independent **claim 1** recites the limitations "*reading data from a first mirror of a*

data volume in response to receiving the first read request", "*reading data from a*

second mirror of the data volume in response to receiving the first read request", and

"*returning the data read from the first mirror to the computer system*". These limitations

are taught by Wilner (US 6,993,677). However, claim 1 further recites the limitation

"*storing the data read from the second mirror into a cache memory*". These limitations,

in combination with the other limitations of claim 1, are not taught or suggested by the

prior art of record. The invention disclosed by Wilner teaches comparing the data items

read from the first and second mirrors, and returning a matching item if they compare

equally. Wilner does not teach storing the data read from the second mirror in a cache

memory. If the data read from the first and second mirror do not match, data is read from a third mirror, and if the data read from the third mirror matches the data read from the first or second mirror a matching data is returned. The data that does not match is considered to be in error and is corrected. Accordingly, there would be no reason to store a non-matching data item, and if two of the data items match, there is no reason to return one and cache the other. If all three data items do not match, the system returns an error. If the storage system has decided that the data is in error, there is no reason to return data read from a first mirror and cache data read from a second mirror.

34.   **Claims 2-8** depend from claim 1 and are considered allowable for at least the same reasons as claim 1.

35.   Independent **claim 9** recites the limitations *"reading data from a first mirror of a data volume in response to receiving the first read request"*, *"reading data from a second mirror of the data volume in response to receiving the first read request"*, *"returning the data read from the first mirror to the computer system"*, and *"storing the data read from the second mirror into a cache memory"*. As discussed *supra*, these limitations, in combination with the other limitations of claim 9, are not taught or suggested by the prior art of record.

36.   **Claims 10-16** depend from claim 9 and are considered allowable for at least the same reasons as claim 9.

37.   Independent **claim 18** recites the limitations *"reading data from the first mirror in response to receiving the first read request"*, *"reading data from the second mirror of the data volume in response to receiving the first read request"*, *"returning the data read*

from the first mirror to the computer system", and "*storing the data read from the second*

mirror into a cache memory". As discussed *supra*, these limitations, in combination with

the other limitations of claim 18, are not taught or suggested by the prior art of record.

Conclusion

38.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

      e.   Wilner (US 6,993,677 B1) teaches comparing data read from multiple

mirrors to determine correct data values.

      f.   Bearden et al. (US 2004/0205298) teaches a method for cache pre-

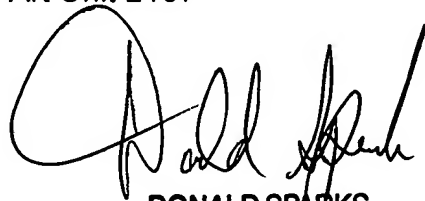fetching in a data storage system.

      Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jared I. Rutz whose telephone number is (571) 272-

5535. The examiner can normally be reached on M-F 8:00 AM - 4:00 PM.

      If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Donald Sparks can be reached on (571) 272-4201. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

jir

Jared I Rutz
Examiner
Art Unit 2187

DONALD SPARKS
SUPERVISORY PATENT EXAMINER